Maryland Square PCE Site
Frequently Asked Questions
January, 2008

1Q. What is the nature of the contamination?

The contaminant of concern is perchloroethylene, also known as tetracholoroethylene, "perc", or PCE. It is a colorless, nonflammable liquid that does not occur naturally. PCE is a solvent/degreaser used by dry cleaners to clean fabrics, and is also found in some common household products. The National Institute for Occupational Safety and Health (NIOSH) reports that approximately 85 percent of dry cleaners still use PCE for cleaning clothes (http://www.cdc.gov/niosh/topics/dryclean/).

The source of the PCE in this case is believed to be the former Al Phillips the Cleaners located at 3661 S. Maryland Parkway (just north of the intersection of S. Maryland Parkway and Twain Avenue) in Las Vegas. In 2004, liability for the on-site contamination was accepted by DCI Management Group Ltd., the parent company of Al Phillips the Cleaners. The dry-cleaner building has since been demolished, and the property is currently vacant.

Discharges of PCE by the dry cleaner resulted in soil contamination at the site. Data collected in subsequent investigations indicate that PCE leached from the soil into the shallow groundwater, forming an area of contaminated groundwater (known as a "plume") that is about 400 feet wide and at least 4,000 feet long. The contaminated groundwater is 10 to 25 feet below the ground surface. The plume of contaminated groundwater extends to the east, beneath the Boulevard Mall and under some residences and a golf course in the neighborhood east of the mall.

2Q. Is the neighborhood drinking water safe?

Yes, the drinking water is safe. The contamination is limited to the shallow ground water. Drinking water for residents in the Maryland Square area is provided by the Las Vegas Valley Water District which does **not** use shallow groundwater for its water supply. As such, drinking water is NOT AFFECTED by this contamination.

3Q. Why was the air inside neighborhood homes tested?

PCE in groundwater evaporates, creating vapors that fill spaces in subsurface soil. Vapors in the soils above the contaminated groundwater can migrate upward and into buildings that overlie the plume. This process is called "vapor intrusion."

Soil vapor testing in the east parking lot of the Boulevard Mall and along Spencer Street in April of 2007 confirmed the presence of PCE in soil vapors in the area. Modeling of the Maryland Square PCE plume by the Nevada Division of Environmental Protection (NDEP), and comparison of those modeling results to those of other sites evaluated by environmental and health agencies across the U.S., suggested that vapor intrusion may be occurring in some homes located above the plume. Therefore, as a precautionary

health-protective measure, the NDEP initiated a comprehensive outreach program to visit with the owners/occupants of each home, explain the situation to them, and recommend and conduct testing to determine if PCE vapors are present in their home. About half of the property owners called the NDEP to have the indoor air in their homes tested. Those tests were conducted in September and October 2007, and the results were provided to the owners on November 28, 2007.

Some of the homes tested had concentrations of PCE that exceeded the action level. However, it is important to keep in mind that **none** of the homes contained PCE at concentrations that pose an immediate health concern.

4Q. Is there a potential health concern?

Based on all the data collected for samples of indoor air, there is no immediate health concern. The few homes that contained PCE above the action level for long-term exposure did **not** contain concentrations that are known to produce short-term health effects (see Figure 1).

The highest concentrations measured in area homes are still far lower (orders of magnitude) than concentrations that produce immediate health effects. People exposed to extremely high levels of PCE may experience dizziness, fatigue, headaches, confusion, nausea, and skin, lung, eye and mucous membrane irritation, as well as liver and respiratory damage. PCE exposure in extremely high levels can also harm developing fetuses.

The NDEP initiated the testing of the indoor air in neighborhood homes as a precautionary measure to let owners know for sure whether the concentration of PCE in their indoor air exceeds the EPA's long-term health protective level, and to inform them of the options for mitigating the problem should the need arise.

5Q. What is the basis for the action level?

The effects of PCE on human health depend upon the length and frequency of the exposure, in addition to the concentration. Based on testing of lab animals, PCE is believed to be a "possible to probable" carcinogen. To evaluate carcinogenic effects, the U.S. Environmental Protection Agency (EPA) evaluates long-term exposures based on continuous (24 hours per day) exposure for 30 years or more.

Based on EPA's analysis, the NDEP has adopted an action level of 32 micrograms per cubic meter ($\mu g/m^3$) for residential indoor air. **Figure 1** shows how the range of PCE concentrations that can be encountered relate to the action level and to various health effects.

Because of the time required for the contaminant to migrate from the source area to the neighborhood, it is highly unlikely that residents living in the area of the Maryland Square PCE plume have been continuously exposed to the contaminant at concentrations exceeding the action level for 30 years.

Assuming that a leak started when the dry cleaner opened in 1969, preliminary calculations performed by the NDEP suggest that it took approximately 25 to 30 years for the contamination to reach its current levels in the neighborhood, although the leading edge of the plume may have reached the western boundary of the neighborhood as early as the mid-1980s.

6Q. What type of testing was done in the homes?

The NDEP used air sampling devices called "Summa canisters," which were placed in the homes for a period of approximately 24 hours. About the size of a basketball, these sampling devices collected air samples from the living area of the home for analysis at an off-site laboratory. This testing allowed the NDEP to determine if PCE vapors had entered the home at levels that pose any potential health concerns. Results from the laboratory analysis were provided to the residents on November 28, 2007.

The sampling and analysis were performed at no cost to the homeowners. Based on results of these samples, additional homes will be offered sampling in February, 2008. Additionally, all testing results are being kept confidential with respect to the address of the home, and are being shared only with individual residents and homeowners.

7Q. What will happen in those instances where PCE vapors were found in a home?

There is an effective treatment system that can be installed to immediately reduce the amount of PCE entering the home. NDEP will help to facilitate and support resident efforts to install such a system in homes that exceed the action level.

The recommended technology is adapted from techniques developed with EPA in the 1980s to prevent naturally occurring radon gas from entering homes. Sometimes called a "radon mitigation system" or "sub-slab depressurization system," the technology involves sealing off noticeable cracks in the floors and around piping, and installing a venting pipe beneath the foundation that is connected to a fan. The fan creates a vacuum beneath the foundation that controls and reduces the amount of soil gas entering the home by pulling and venting the vapors to the outdoor air, where concentrations are quickly dispersed to low levels.

8Q. How would the detection of PCE vapors in my home affect the value of my property?

NDEP officials are not real estate experts, and thus cannot predict what, if any, negative impact on property values might result from PCE- contaminated groundwater migrating under a neighborhood or the detection of PCE vapors in a home.

A good resource for property value information is a local government agency— such as your local taxing authority or planning commission—or a local real estate professional. They are experienced in appraising property values and determining the possible effect of contamination on property values.

The NDEP works with the affected community to find a cleanup solution that is safe, effective and, to the extent possible, minimally disruptive to ongoing activities.

9Q. What will be done to clean up the shallow groundwater?

The NDEP will soon mandate that the responsible parties clean up the contamination, and prepare an engineering design for the installation and operation of a groundwater remediation system to reduce concentrations of PCE in the shallow groundwater. The design must be reviewed and approved by the NDEP. The system is expected to be installed upgradient of the neighborhood within a year or two, depending on the complexities of the engineering design.

The system will begin reducing concentrations in the shallow groundwater soon after installation is completed. The NDEP anticipates that it will take 5 to 10 years to adequately clean up the shallow groundwater under the neighborhood, but the remediation system will prevent any new PCE from migrating under the neighborhood. Monitoring of groundwater will continue until it is determined that it is no longer necessary to operate household treatment systems, if any have been installed.

10Q. Is contaminated soil vapor the only source of volatile organic chemicals in my indoor air?

No. Volatile organic chemicals (VOCs) are also found in many household products. Paints, paint strippers and thinners, mineral spirits, glues, solvents, cigarette smoke, aerosol sprays, mothballs, air fresheners, new carpeting or furniture, hobby supplies, lubricants, stored fuels, refrigerants and recently dry-cleaned clothing all contain VOCs. Household products are often more of a source of VOCs in indoor air in homes than contaminated soil vapor. Indoor air may also become affected when outdoor air containing volatile chemicals enters your home. Volatile chemicals are present in outdoor air due to their widespread use. Gasoline stations, dry cleaners, and other commercial/industrial facilities are important sources of VOCs to outdoor air.

11Q. What else can I do to improve my indoor air quality?

Household products and other factors, such as mold growth, carbon monoxide, and radon, can degrade the quality of air in your home. Consider the following tips to improve indoor air quality:

- Be aware of household products that contain VOCs. Do not buy more chemicals than you need at a time.
- Store unused chemicals in tightly-sealed containers in a well-ventilated location, preferably away from the living space in your home.
- Keep your home properly ventilated. Keeping it too air-tight may promote build up of chemicals in the air, as well as mold growth due to the build up of moisture.
- Fix all leaks promptly, as well as other moisture problems that encourage mold growth.

- Make sure your heating system, hot water, dryer and fireplaces are properly vented and in good condition. Have your furnace or boiler checked annually by a professional.
- Test your home for radon; take actions to reduce radon levels if needed.
- Install carbon monoxide detectors in your home; take immediate actions to reduce carbon monoxide levels if needed.

12Q. What are background levels for PCE in indoor and outdoor air in areas that are not near a known source of PCE?

The United States Environmental Protection Agency (US EPA) analyzed information on PCE levels in indoor and outdoor air samples collected inside and outside of buildings that were not near known sources of PCE and other chemicals. The middle half (25^{th} to 75^{th} percentile) of concentrations in indoor and outdoor air samples was about 1 to 10 µg/m^3. Collectively, these data show that background levels of PCE in indoor air are seldom above 10 µg/m^3.

- The US EPA Volatile Organic Compounds (VOCs) Database was published in March 1988.
- From 1994 through 1996, US EPA measured VOCs in indoor and outdoor air at 100 randomly selected public and private office buildings across the US.

13Q. How did the Maryland Square PCE problem develop?

See the Background document.

14Q. How can I get more information?

Each homeowner/occupant in the affected area has been contacted personally, and individual meetings have been held. The NDEP continues to be committed to providing as much information as possible to the property owners, residents and other interested parties. Inquiries about the case may be directed to the **dedicated, resident call-in line for the Maryland Square PCE site** at **(702) 486-0975**. You may leave a message and your call will be returned the next business day.

Additional Information

Information is also available on the NDEP website at http://www.ndep.nv.gov/pce

Additional information on **PCE** can be found at the following websites:

http://www.atsdr.cdc.gov/tfacts18.pdf

http://www.epa.gov/ttn/atw/hlthef/tet-ethy.html

Additional information on the **vapor intrusion exposure pathway** can be found at:

http://www.epa.gov/swerosps/bf/facts/vapor_intrusion.pdf

http://www.health.state.ny.us/environmental/investigations/soil_gas/svi_guidance/docs/svi_faqs.pdf

http://www.ecy.wa.gov/programs/tcp/sites/cadet/Dept%20of%20Health%20Vapor%20Intrusion%20fact%20sheet.pdf

Figure 1. PCE levels in air